



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/505,334	08/23/2004	Shuichi Ichikawa	120868	3762
25944	7590	05/18/2006		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER VERBITSKY, GAIL KAPLAN	
			ART UNIT 2859	PAPER NUMBER

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/505,334

Applicant(s)

ICHIKAWA ET AL.

Examiner

Gail Verbitsky

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 18-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-17, 22, 24 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (U.S. 5846276) [hereinafter Nagai] in view of Amer et al. (U.S. 6331075) [hereinafter Amer].

Nagai teaches that a honeycomb structure should be tested for thermal conductivity using a thermal conductivity meter.

Nagai does not teach the particular thermal conductivity meter.

Amer teaches to measure heat conductivity of a specimen/ sample (of different thicknesses), as shown in Figs. 1, 3, in transient or steady state modes. The specimen is connected to two heat conductive (high thermal conductivity) slabs (contact members) at its two ends; the slabs are instrumented with thermocouples. In the steady state mode, the two slabs are, inherently, kept at given different temperatures. The thermal conductivity of the specimen (thin film) is calculated by using formulas in cols. 3-5 derived from a Fourier transform. Amer teaches to apply a contact pressure between the slabs and the specimen. Since there is a heater positioned next to one slabs and not to another, it is inherent, that in a steady state mode, one slab is at a temperature different from another slab temperature.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a method, disclosed by Amer, to measure a thermal conductivity of a structure taught by Nagai, to measure a thermal conductivity of a structure taught by Kishimoto, so as to provide the honeycomb structure with a conduction path through the honeycomb structure, as very well known in the art, and thus, obtaining data how the structure conducts heat.

With respect to claim 22: the particular contact pressure, i.e., 1 to 10 kg/ cm², as stated in claim 22, absent any criticality, is only considered to be the "optimum" pressure that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the particular geometry of a sample and the desired accuracy of the measurements, etc. See in re Boesch, 205 USPQ 215 (CCPA 1980).

With respect to claim 24: the particular thermal conductivity of the honeycomb structure, i.e., 1W/ mK or more, as stated in claim 24, absent any criticality, is only considered to be the "optimum" thermal conductivity that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the intended use of the device/ honeycomb structure, etc. See in re Boesch, 205 USPQ 215 (CCPA 1980).

With respect to claims 16-17: using the particular material, i.e., material of a high flexibility, used for the highly conductive member, as stated in claims 16-17, absent any criticality, is only considered to be the "optimum" material that a person having ordinary skill in the art at the time the invention was made would have been able to determine

Art Unit: 2859

using routine experimentation based, among other things, on the intended use of the device/ honeycomb structure, its porosity and thickness, so as not to damage the honeycomb structure during the test by using flexible contacts under pressure, etc. See in re Boesch, 205 USPQ 215 (CCPA 1980).

The method steps will be met during the normal operation of the device stated above.

3. Claim 25 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai and Amer, as applied to claims 11-17, 22, 24 above, and further in view of Kirino et al. (U.S. 6730421) [hereinafter Kirino].

Nagai and Amer disclose a device as stated above.

They do not teach the particular material to make the honeycomb structure.

With respect to claim 25: see, for example, Kirino et al. (U.s. 6730421) who teach that a honeycomb structure can be made of silicon nitride.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the structure, disclosed by Nagai and Amer, of silicon nitride, as taught by Kirino, so as to allow the operator to test a thermally conductive honeycomb structure made of silicon nitride material because this material has its own thermal conductivity which is an important factor when a honeycomb structure is being used as, for example, a thermal interface device, in order to know the thermal conductivity of the interface device or heat sink device, and thus, to prevent an object of interest from overheating, by using a known material on the basis of its suitability for the intended use of the invention.

The method steps will be met during the normal operation of the device stated above.

4. Claims 11-17, 23 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Kishimoto et al. (U.S. 5693685) [hereinafter Kishimoto] in view of Amer.

Kishimoto teaches a honeycomb structure/ device as shown in Fig. 1. Kishimoto teaches that its thermal conductivity was (needs to be) determined (col. 13, lines 9-15). For claim 23: Kishimoto teaches that sides of the honeycomb structure are covered with a heat-insulating material (container) 1.

Kishimoto does not teach the particular method for determining thermal conductivity.

Amer teaches to measure heat conductivity of a specimen/ sample (of different thicknesses), as shown in Figs. 1, 3, in transient or steady state modes. The specimen is connected to two heat conductive (high thermal conductivity) slabs (contact members) at its two ends; the slabs are instrumented with thermocouples. In the steady state mode, the two slabs are, inherently, kept at given different temperatures. The thermal conductivity of the specimen (thin film) is calculated by using formulas in cols. 3-5 derived from a Fourier transform. Amer teaches to apply a contact pressure between the slabs and the specimen. Since there is a heater positioned next to one slabs and not to another, it is inherent, that in a steady state mode, one slab is at a temperature different from another slab temperature.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a method taught by Amer, to measure a thermal conductivity of a structure of Kishimoto, so as to provide the honeycomb structure with a conduction path through the honeycomb structure, as very well known in the art, and thus, obtaining data how the structure conducts heat.

With respect to claim 22: the particular contact pressure, i.e., 1 to 10 kg/ cm², as stated in claim 22, absent any criticality, is only considered to be the “optimum” pressure that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the particular geometry of a sample and the desired accuracy of the measurements, etc. See in re Boesch, 205 USPQ 215 (CCPA 1980).

With respect to claims 16-17: using the particular material, i.e., material of a high flexibility, used for the highly conductive member, as stated in claims 16-17, absent any criticality, is only considered to be the “optimum” material that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the intended use of the device/ honeycomb structure, its porosity and thickness, so as not to damage the honeycomb structure during the test by using flexible contacts under pressure, etc. See in re Boesch, 205 USPQ 215 (CCPA 1980).

The method steps will be met during the normal operation of the device stated above.

Allowable Subject Matter

5. Claims 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed on April 03, 2006 have been fully considered but they are not persuasive. Applicant states that the method of Amer is not applicable (and

such, that Amer cannot be combined with Nagai) since honeycomb structures cannot be of size of 50-150 microns, while Amer measures thermal conductivity of a a small sample/ structure as 50-150 microns. This argument is not persuasive because, although Amer's sample is small and not compatible with the applicant honeycomb structure, it is very well known in the art that, the "thermal conductivity" is a property of a material that describes (and such could be measured) the rate of heat flow, in steady state, between the two surfaces of the material for a given temperature difference between the two surfaces (see also U.S. 20030192693, [0760], for definition). Therefore, Amer is used by the examiner as a secondary reference only for its teaching of a conventional method of measuring thermal conductivity of a sample/ material. This would imply, that the method, when modified, could be measured with a sample/ material of any desired size.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gail Verbitsky whose telephone number is 571/ 272-2253. The examiner can normally be reached on 7:30 to 4:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571/ 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GKV

Gail Verbitsky
Primary Patent Examiner, TC 2800



May 05, 2006